

# Technical Bulletin

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## RDOS 3.08 FOR THE 16FDC AND 64FDC

Version 3.08 of Cromemco RDOS is now available for use with the 16FDC and 64FDC disk controller boards. RDOS 3.08 ROMs (part number 502-0097) are available from the Cromemco Customer Service Department. A separate service note, RDOS 3.08 Upgrade for the 64FDC or 16FDC (part number 023-9125), describes the necessary modifications.

RDOS 3.08 offers several improvements over previous versions; these improvements are described below.

### NEW AND MODIFIED RDOS COMMANDS

This section describes new RDOS commands and modifications to existing RDOS commands.

#### Boot

##### B

This command performs a boot operation from the disk drive specified by the switch settings on the 16FDC or 64FDC.

**16FDC Switch Settings** - If switch 6 is OFF, the system is booted from the floppy disk drive specified by switches 7 and 8. If switch 6 is ON, the system is booted from the hard disk drive specified by switches 7 and 8.

Switch 6	Switch 7	Switch 8	
OFF	OFF	OFF	Floppy Disk A
OFF	OFF	ON	Floppy Disk B
OFF	ON	OFF	Floppy Disk C
OFF	ON	ON	Floppy Disk D
ON	OFF	OFF	Hard Disk 0
ON	OFF	ON	Hard Disk 1
ON	ON	OFF	Hard Disk 2
ON	ON	ON	Hard Disk 3

**64FDC Switch Settings** - If switch 2 is OFF, the system is booted from the floppy disk drive specified by switches 3 and 4. If switch 2 is ON, the system is booted from the hard disk drive specified by switches 3 and 4.

Switch 2	Switch 3	Switch 4	
OFF	OFF	OFF	Floppy Disk A
OFF	OFF	ON	Floppy Disk B
OFF	ON	OFF	Floppy Disk C
OFF	ON	ON	Floppy Disk D
ON	OFF	OFF	Hard Disk 0
ON	OFF	ON	Hard Disk 1
ON	ON	OFF	Hard Disk 2
ON	ON	ON	Hard Disk 3

**Boot Sequence** - On receiving the Boot command, RDOS checks the system memory. The memory check displays a list of all 4K blocks in the first 64K bank of memory (in 68000 machines, not all memory is checked), followed by a display of which blocks have errors and which blocks have no errors. A "^" under the block number indicates that all bytes in that block are functioning correctly; an "X" indicates one or more bytes has failed. ROM or non-existent memory appears in the results as a failed block.

Next, RDOS displays the message "Preparing to BOOT, ESC to Abort" indicating that the boot command has been received. RDOS then pauses for a few seconds while determining the type of disk drive specified and the type of seek. Once RDOS has read the system boot information from the disk into memory, it displays the message "Standby" indicating that the boot is proceeding normally.

At this point, you might also receive the message "No boot" indicating that the disk being used does not contain the boot information, or the message "Unable to boot" indicating that RDOS is unable to read the boot information from the disk. Either of these two conditions must be corrected by booting from another disk and then repairing the original disk.

Between display of the messages "Preparing to boot" and "Standby" you may abort the boot and return control to RDOS by pressing the ESCAPE key. If the boot sequence is not aborted, the operating system should come up and display its prompt.

## **Boot from Floppy Disk**

Bx

This command performs a boot operation (as described above) from the floppy disk specified; x is a drive letter from A to D.

## **Boot from Hard Disk**

BHx

This command performs a boot operation (as above) from the hard disk specified; x is a drive number from 0 to 3.

## **Select Hard Disk**

Hx

This command selects a hard disk drive for further use; x is a drive number from 0 to 3.

The first sector from the disk is read into memory at 80h to determine the file structure type (i.e., whether or not the disk is in Cromix format). If the disk is in Cromix format, then the "Superblock" will be read into memory at 80h (overlying the first sector in memory). The hard disk type is determined via the hardware. There are no options when selecting a hard disk.

## **Read All of Disk**

RA

This command reads all of the currently selected disk, sector by sector. The user is prompted for the disk range. The RA command reads the range specified, using standardly defined interleave factors for that particular type of disk. The data is read into memory at 80h to check for hard disk errors that might otherwise be missed. The surface and cylinder numbers are displayed.

## **Test the System**

T  
TZ  
TX

This command tests the system.

The T command moves RDOS out of its ROM at C000h to RAM at 100h, enables the upper block of RAM, and moves RDOS back into RAM at C000h.

The TZ command does not do this transfer, and may be used to test systems with no RAM at C000h. The TZ command cannot be used in 68000 Cromix systems that have MSU memory boards.

In either case the command then performs a quick check of the system memory. The memory check displays a list of all 4K blocks in the first 64K bank of memory, followed by a map showing which blocks have errors or no errors. A "^" under the block number indicates that all bytes in that block are functioning correctly; an "X" indicates that one or more bytes failed. ROM or non-existent memory appears in the results as a failed block.

The TX command performs the same memory tests as the T command, but for all Cromix Z80 memory banks in the system (the TX command checks only the first 64K block of memory in 68000 Cromix systems with MSU memory boards).

**Note:** After executing the first or third form of the command, RDOS resides in RAM (in bank 0) from C000h to DFFFh. The user should be careful not to overwrite this part of RAM.

After the memory test, the user is prompted for which type of disk drive to test. The possible answers are F (for floppy) or H (for hard disk). The prompts accept responses from the user without having to enter a RETURN; RETURN may be used during these specification prompts to abort the command.

The user will be asked for the drive (or unit number, in the case of a hard disk). Valid entries are A through D (for floppy) or 0 through 3 (for hard disk). If a hard disk drive is specified, testing will begin immediately. If a floppy disk drive is specified, the user will be asked for the drive size. Either L (for large) or S (for small) may be entered.

The final prompt asks for the drive seek speed. The user may enter either S (for slow seek), or F (for fast seek). When the test is finished, the drive tested will remain selected.

If a floppy disk drive is selected, a sequence of seek operations is performed on the drive, ending up on the drive's far inside cylinder, on side 0. Several read/write operations are then performed on sector 1 of that track. A prompt allows the user to continue or quit when the write tests are about to be performed. Type ESCAPE to quit or RETURN to continue.

If a hard disk drive is selected, tests are performed for the WDI command data bus, followed by a memory-to-memory DMA transfer to test the WDI DMA chip. Index pulses from the specified drive are looked for; if they are found, the RPM is calculated and displayed. If the RPM is within range, the number of sectors per track are counted and displayed. A typical display for a hard disk drive that passes the test is shown below (xxxx and xx represent actual values):

```
CMD Data Bus OK
Mem-To-Mem DMA OK
Index pulses received OK
Rotational speed xxxx RPM
Sector Pulses xx per Cylinder
```

For IMI 7710, 5021, or 5018 hard disk drives, the RPM should be 3600 +/- 3%. For IMI 5007 hard disk drives, the RPM should be 4800 +/- 3%.

If the rotational speed is outside the allowed range, the message "Illegal drive speed" will be displayed, and the testing will be terminated.

If the message "Timeout" appears, the WDI card did not respond in time with the required information. If the message "Overflow" appears, an error occurred in some calculation. These messages indicate a problem with the WDI interface or with the disk.

Normally, there should be 20 sector pulses per cylinder.

#### DELETED RDOS COMMANDS

The following RDOS commands have been dropped from RDOS 03.08:

- A (Alignment Option)
- L (List All Disks Logged In)
- Q (Query)
- SX (Set Disk Side)
- Z (Zap Memory)